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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,566	09/22/2003	Jennifer M. Kurtz	C-3045	1655
7590	04/04/2006		EXAMINER	
William W. Jones 6 Juniper Lane Madison, CT 06443			PARSONS, THOMAS H	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/666,566

Applicant(s)

KURTZ ET AL.

Examiner

Thomas H. Parsons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-18 is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

This is in response to the Amendment filed 6 March 2006.

(Previous) DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The rejection of claim 1 under 35 U.S.C. 102(b) as being anticipated by EP 0 263 052 has been **withdrawn** in view of Applicants' Amendment. Further, the finality of the previous Office Action has been **withdrawn** in view of a new rejection.

(New) DETAILED ACTION

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear as to how an air reactant *inlet* flow passage can have a plurality of *outlets* operatively connectable to separate ones of the fuel cell stacks in the power plant power section so as to direct air *into* each of the separate fuel cell stacks in the power plant power section, and how an air reactant *outlet* flow passage can have a plurality of *inlets* operatively connectable to separate ones of the fuel cell stacks in the power plant power section so as to direct air *out* of each of the separate fuel cell stacks in the power plant power section.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 263 052.

Claim 1: EP 0 263 052 in Figure 2 discloses a unitary manifold assembly for use in controlling the flow of reactant gas streams between a plurality of fuel cell stacks in a fuel cell power plant, comprising a fuel gas passage (102) having a plurality of fuel gas inlets (106, 104) for selective connection to a plurality of fuel cell stacks in a first stage of power plant fuel cell stacks (1 and 2), said fuel gas passage being operative to receive partially expended fuel gas streams exhausted from the plurality of fuel cell stacks (via 110, 112) and to combine the partially expended fuel gas streams into a combined fuel gas stream (108), and the fuel gas passage having a fuel gas outlet (108) for directing the combined fuel gas stream to at least one second stage power plant fuel cell stack (3) whereby the combined fuel gas stream is used to provide fuel for the second stage power plant fuel cell stack, the first (1, 2) and second (3) fuel cell stack stages forming at least a part of a power section of the power plant (col. 4: 13-col. 5: 3); the manifold assembly further comprising a fuel gas exhaust passage (conduit 114) for operative connection with fuel cell stacks in the second stage (attack 3) thereof, a fuel gas exhaust passage including a fuel gas inlet for receiving spent fuel gas from the fuel cell stacks in

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the second stage (stacks 1 and 3), and a fuel gas outlet for exhausting spent fuel gas from the power section of the power plant.

The Examiner has construed the “**unitary manifold assembly**” as the inlet and outlet manifolds and associated piping assembled together into a single unit making up the fuel distribution system depicted in Figure 2.

Claim 7: EP 0 263 052 discloses that the fuel gas passage is sized so as to provide approximately equal distribution of fuel to each fuel cell stack in the at least one second stage power plant fuel cell stack and minimize pressure drop through the fuel gas passage so as to minimize back flow of the fuel gas stream in the fuel gas passage (col. 2: 21-27, col. 4: 40-45, and col. 5: 40-45).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 263 052 as applied to claim 1 above, and further in view of Jones et al. (6,739,302).

EP 0 263 052 is as applied, argued, and disclosed above, and incorporated herein.

Claim 5: EP 263 052 does not disclose a manifold assembly formed from thermoformed components.

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Jones et al. discloses in Figures 1 and 2 a manifold assembly formed from thermoformed components (col. 4: 56-64; col. 4: 55-67; and col. 6: 16-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of EP 0 263 052 by incorporating the thermoformed components of Jones et al. because Jones et al. disclose teaches a manifold assembly that would have exhibited substantially no degradation due in the presence of automotive vehicle fluids, such as ethanol or methanol, or due to the exposure to environmentally encountered compounds such as exhaust gases.

Claim 6: The recitation “said manifold assembly is formed by twinsheet thermoforming” has been considered, and construed as a product by process limitation that add not additional structure to the manifold. Accordingly, the rejection is as set forth above in claim 5.

8. Claims 3, 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 263 052 as applied to claim 1 above, and further in view of Mukerjee et al. (6,692,859).

EP 0 263 052 is as applied, argued, and disclosed above, and incorporated herein.

Claim 3: EP 0 263 052 does not disclose least two separate air reactant flow passages one of which is an air reactant inlet flow passage, and another of which is an air reactant outlet flow passage, the air reactant inlet flow passage having a plurality of inlets which are operatively connectable to separate ones of the fuel cell stacks in the power plant power section so as to direct air into each of the separate fuel cell stacks in the power plant power section, and the air reactant outlet flow passage having a plurality of outlets which are operatively connectable to separate ones of the fuel cell stacks in the power plant power section, whereby the air reactant

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flow passages are operative to direct an air reactant stream into and out of each of the fuel cell stacks in the power section of the power plant in parallel fashion.

Mukerjee et al. in Figures 1 and 4 disclose least two separate air reactant flow passages one of which is an air reactant inlet flow passage (86), and another of which is an air reactant outlet flow passage (92), the air reactant inlet flow passage having a plurality of inlets (88) which are operatively connectable to separate ones of the fuel cell stacks in the power plant power section so as to direct air into each of the separate fuel cell stacks in the power plant power section, and the air reactant outlet flow passage having a plurality of outlets (90) which are operatively connectable to separate ones of the fuel cell stacks in the power plant power section, whereby the air reactant flow passages are operative to direct an air reactant stream into and out of each of the fuel cell stacks in the power section of the power plant in parallel fashion (col. 6" 41-56).

Claim 4: EP 0 263 052 does not disclose single air inlet chamber is operatively connected with said air reactant inlet flow passage so as to direct a stream of air to said air reactant inlet flow passage.

Mukerjee et al. in Figures 1 and 4 disclose a single air inlet chamber (air inlet port 86) operatively connected with the air reactant inlet flow passage (stack air inlet ports) so as to direct a stream of air to the air reactant inlet flow passage.

Claim 8: EP 0 263 052 does not disclose manifold assembly is provided with alignment means for fixedly aligning the fuel cell stacks relative to said manifold assembly fuel gas and air passages.

Mukerjee et al. in Figures 1 and 4 disclose a manifold assembly provided with alignment means (stack-mounting hardware) for fixedly aligning the fuel cell stacks relative to the manifold assembly fuel gas and air passages (col. 7: 14-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of EP 0 263 052 by incorporating the air reactant air inlet and outlet passages, the single air inlet chamber, and the alignment means of Mukerjee et al. because Mukerjee et al. teaches a manifold assembly that would have permitted the total number of cells to be easily adjusted to meet specific electrical design criteria, permitted balancing the stack-to-stack voltage distribution and corresponding stack-to-stack power distribution, maintained a minimum variance for increasing current loads, and simplified flow management by utilizing shorter flow paths allowed by shorter stacks thereby improving the overall performance and efficiency of the fuel cell stack.

Allowable Subject Matter

9. Claims 9-18 are allowable over the prior art of record.

Reasons for Indicating Allowable Subject Matter

10. The following is a statement of reasons for the indication of allowable subject matter:

The claimed invention is directed towards a unitary manifold assembly comprising a ***single fuel gas passage*** connected to a plurality of fuel cell stacks in one stage of fuel cell stacks,

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fuel gas passage being operative to receive partially expended fuel gas streams exhausted from the plurality of fuel cell stacks and to combine partially expended fuel gas streams into a combined fuel gas stream, and the fuel gas passage also being connected to the at least one fuel cell stack in the subsequent stage for directing the combined fuel gas stream to the least one fuel cell stack in the subsequent stage.

In contrast, EP 0 263 052 discloses a manifold assembly comprising inlet and outlet manifolds and associated piping (conduits) (i.e. a plurality of fuel gas passages) connected to a plurality of fuel cell stacks for providing a first amount of fuel to a first stage of fuel cells and for delivering a combined fuel exhaust from the first stage to a second stage of fuel cells. EP 0 263 052 does not teach or suggest a *single fuel gas passage* connected to a plurality of fuel cell stacks in one stage of fuel cell stacks and also connected to the at least one fuel cell stack in the subsequent stage.

Accordingly, claim 9 and claims 10-16, which are dependent thereon, are patentably distinct from the prior art of record.

The claimed invention is also directed toward a method for providing a fuel gas reactant and an air reactant to a multistage fuel cell power plant power section which power section includes a first fuel cell stack stage having a plurality of fuel cell stack assemblies, and a subsequent fuel cell stack stage having at least one fuel cell stack assembly, the method comprising the steps of: a) providing *a one piece reactant transfer manifold assembly* which is connected to each of the fuel cell stacks in the power plant power section; b) directing streams of a fuel gas into each of the fuel cell stack assemblies in the first fuel cell stack stage; and c) combining partially spent fuel gas streams from each of the fuel cell stack assemblies in the first

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fuel cell stack stage into a single fuel gas stream in the transfer manifold, and directing the combined single fuel gas stream through a *single fuel gas passage in the transfer manifold* to the at least one fuel cell stack assembly in the subsequent fuel cell stack stage so as to provide a fuel gas stream for the subsequent fuel cell stack stage.

EP 0 263 052 discloses a method for providing a fuel gas reactant and an air reactant to a multistage fuel cell power plant power section which power section includes a first fuel cell stack stage having a plurality of fuel cell stack assemblies, and a subsequent fuel cell stack stage having at least one fuel cell stack assembly, the method comprising the steps of providing inlet and outlet manifolds and associated piping (conduits) connected to a plurality of fuel cell stacks for providing a first amount of fuel to a first stage of fuel cells and for delivering a combined fuel exhaust from the first stage to a second stage of fuel cells. EP 0 263 052 does not teach or disclose a *one piece reactant transfer manifold assembly*.

Accordingly, claim 17 and claim 18, which is dependent thereon, are patentably distinct from the prior art of record.

Response to Arguments

11. Applicant's arguments filed 19 January 2006 have been fully considered but they are not persuasive.

The Examiner has construed the “**unitary manifold assembly**” as comprising a fuel gas passage (102) having a plurality of branch inlets (104, 106) and outlets conduits 110, 112, 108) and associated piping assembled together (collectively) into a single unit making up the fuel distribution system depicted in Figure 2. The claim has been broadly interpreted as a single fuel

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distribution system comprising a main fuel gas passage having a plurality of inlet and outlet branches that collectively distributes fuel and exhaust between a first stage (stack 1 and 2) and a second stage (stack 3).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

Thomas H Parsons
Examiner
Art Unit 1745
